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EXAMINER	
LOVEL, KIMBERLY M	
ART UNIT	**PAPER NUMBER**
2167	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/754,010	DAY ET AL.	
	Examiner	Art Unit	
	Kimberly Lovel	2167	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-8,10-16 and 18-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 3-8, 10-16 and 18-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This communication is responsive to the Amendment filed 27 October 2006.

2. Claims 1, 3-8, 10-16 and 18-21 are pending in this application. Claims 1, 7, 12, 13, 15 and 16 are independent. In the Amendment file 27 October 2006, claims 1, 7, 10, 12, 13, 15, 16, 19, 20 and 21 have been amended. This action is made Final.

3. The rejections of claims 1, 3-8, 9-16 and 18-21 as being unpatentable over US PGPub 2002/0198867 to Lohman et al in view of the article "Efficient Mid-Query Re-Optimization of Sub-Optimal Query Execution Plans" by Kabra et al have been withdrawn as necessitated by amendment and arguments.

Claim Objections

4. The objections to the claims are withdrawn as necessitated by amendment.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. The rejections under 35 U.S.C. 101 of Claims 13-15 because the claimed invention is directed to non-statutory subject matter are withdrawn as necessitated by amendment.

7. **Claims 1, 3, 4, 7, 8, 10 and 12** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 1 recites a method for automatic handling of errors within a database engine, the method comprising the steps of: detecting an error while executing a query access plan, wherein the error is an execution error of a type that halts execution of the query access plan; in response to detecting the error automatically rebuilding the query access plan to generate a new query access plan; and executing the new query access plan.

In the above limitation, there is no physical transformation being claimed, a practical application would be established by a useful, concrete and tangible result.

For the result to be tangible, it must be more than a thought or a computation and must have a real world value rather than being an abstract idea. The invention as recited in the claim yields the execution of the new query access plan. An example of a tangible result would be either storing or displaying the results from the execution of the plan.

Claims 3 and 4 are dependent on the method of claim 1, and therefore are rejected on the same grounds as claim 1.

Claim 7 recites a method for automatic handling of errors within a database engine, the method comprising the steps of: receiving an error while executing a function within a query access plan, wherein the error is an execution error of a type that halts execution of the query access plan; identifying a first implementation method of the function within the query access plan; rebuilding the query access plan by replacing the first implementation method with a second implementation method and executing the new query access plan.

In the above limitation, there is no physical transformation being claimed, a practical application would be established by a useful, concrete and tangible result. For it to be a tangible result, it must be more than a thought or a computation and must have a real world value rather than being an abstract idea. The invention as recited in the claim just merely executes the query access plan and fails to have any type of output as a result of executing the plan.

Claims 8 and 10, which are dependent on claim 7 fail to overcome the rejection and therefore are rejected on the same grounds as claim 7.

Claim 12 recites a method for automatic handling of errors within a database engine, the method comprising the steps of: executing a query access plan comprising a plurality of functions, each function including a first implementation method; detecting a first error when executing a first function, wherein the first error is an execution error of a type that halts execution of the query access plan; rebuilding the query access plan to generate a new query access plan; executing the new query access plan; receiving a second error while executing the first function within the new query access plan; and rebuilding the new query access plan by replacing the first implementation method with a second implementation method of the function.

In the above limitation, there is no physical transformation being claimed, a practical application would be established by a useful, concrete and tangible result. For it to be a tangible result, it must be more than a thought or a computation and must have a real world value rather than being an abstract idea. The invention as recited in the claim just merely rebuilds the new query access plan. The new query access plan

is not displayed, executed or stored. It is unclear as to what kind of tangible output is obtained by these limitations.

To expedite a complete examination of the instant application, the claims rejected under 35 U.S.C. 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four statutory categories of invention.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 1, 3-8, 9-16 and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the article "Efficient Mid-Query Re-Optimization of Sub-Optimal Query Execution Plans" by Kabra et al (hereafter Kabra) in view of US Patent No 6,092,099 to Irie et al (hereafter Irie).

Referring to claim 1, Kabra et al disclose a method for automatic handling of errors within a database engine (see abstract, lines 6-8 – the sub-optimality is considered to represent the *error*), including the further limitations of:

detecting an error while executing a query access plan (see page 109, column 2, lines 34-37 and page 110, column 1, 10-15 – the error is found during execution of the execution plan; the execution plan is considered to represent the *query access plan*);

in response to detecting the error (see page 109, column 2, line 34 – page 110, column 1, line 4 – after the error is determined the query plan is rebuilt since the

remainder of the query plan is based on the estimate), automatically rebuilding the query access plan to generate a new query access plan (see page 110, column 1, lines 2-4 and lines 13-15 – upon the determination that the plan is sub-optimal, the query optimizer is re-invoked to generate a new execution plan); and

executing the new query access plan (see page 110, column 1, line 15 – the fresh new execution plan for the query is executed). However, Kabra fails to explicitly disclose the further limitation wherein the error is an execution error of a type that halts execution of the query access plan. Irie discloses creating a plan based on a search condition entered by a user and executing the plan (see abstract and Fig 1), including the further limitations of detecting an error while executing the plan, wherein the error is an execution error of a type that halts execution of the query access plan (see column 10, lines 31-38) and in response to detecting the error, automatically rebuilding the query access plan to generate a new query access plan [re-planning] (see column 10, lines 39-41) in order to increase the efficiency and accuracy of the execution of query plans.

It would have been obvious to one of ordinary skill in the art to use Irie's steps for automatically rebuilding a plan after an error has been detected that causes execution to fail with method for query re-optimization as disclosed by Kabra which detects errors due to optimization. One would have been motivated to do so in order to increase the efficiency and accuracy of the execution of query plans with fatal errors.

Referring to claim 3, the combination of Kabra and Irie (hereafter Kabra/Irie) discloses the method of claim 1, wherein the error is a function check [error in the join] (Kabra: see page 109, column 2, lines 29-33).

Referring to claim 4, Kabra/Irie discloses the method of claim 1 further comprising the steps of:

receiving another error while executing a function within the new query access plan (Irie: see Fig 7);

identifying a first implementation method [initial goal] of the function within the new query access plan (Irie: see column 10, lines 31-49); and

rebuilding the new query access plan by replacing the first implementation method with a second implementation method [new goal] of the function so as to generate a rebuilt query access plan (Irie: see column 10, lines 31-49).

Referring to claim 5, Kabra/Irie discloses the method according to claim 1, further comprising the step of: logging information about the error, and the new query access plan (Irie: see Fig 9-11; and Kabra: see page 9, column 1, lines 16-27).

Referring to claim 6, Kabra/Irie discloses the method according to claim 1, further comprising the step of: reporting the error (Irie: see column 10, lines 31-43).

Referring to claim 7, Kabra et al disclose a method for automatic handling of errors within a database engine (see abstract, lines 6-8 – the sub-optimality is considered to represent the *error*), including the further limitations of:

receiving an error while executing a function within a query access plan (see page 109, column 2, lines 34-37 and page 110, column 1, 10-15 – the error is found

during execution of the execution plan; the execution plan is considered to represent the *query access plan*);

rebuilding the query access plan (see page 110, column 1, lines 2-4 and lines 13-15 – upon the determination that the plan is sub-optimal, the query optimizer is re-invoked to generate a new execution plan); and

executing the new query access plan (see page 110, column 1, line 15 – the fresh new execution plan for the query is executed). However, Kabra fails to explicitly disclose the further limitation wherein the error is an execution error of a type that halts execution of the query access plan; and identifying a first implementation method of the function within the new query access plan; and rebuilding the new query access plan by replacing the first implementation method with a second implementation method of the function so as to generate a rebuilt query access plan. Irie discloses creating a plan based on a search condition entered by a user and executing the plan (see abstract and Fig 1), including the further limitations of detecting an error while executing the plan, wherein the error is an execution error of a type that halts execution of the query access plan (see column 10, lines 31-38); identifying a first implementation method [initial goal] of the function within the new query access plan (Irie: see column 10, lines 31-49); and rebuilding the new query access plan by replacing the first implementation method with a second implementation method [new goal] of the function so as to generate a rebuilt query access plan (Irie: see column 10, lines 31-49).

It would have been obvious to one of ordinary skill in the art to use Irie's steps for rebuilding a plan after an error has been detected that causes execution to fail with

method for query re-optimization as disclosed by Kabra, which detects errors due to optimization. One would have been motivated to do so in order to increase the efficiency and accuracy of the execution of query plans with fatal errors.

Referring to claim 8, Kabra/Irie discloses the method of claim 7, wherein the function is one of a join function [error in the join], an indexing function, a grouping function, and an ordering function (Kabra: see page 109, column 2, lines 29-33).

Referring to claim 10, Kabra/Irie discloses the method of claim 7, further comprising the steps of:

receiving another error while executing the function within the new query access plan [the new plan fails] (Irie: see column 10, lines 31-55); and

rebuilding [re-planning] the new query access plan by replacing the second implementation method with a third implementation method of the function (Irie: see column 10, lines 31-55).

Referring to claim 11, Kabra/Irie discloses the method according to claim 10 further comprising the step of: logging information about the error, the another error, and the new query access plan (Irie: see Figs 9-11; and Kabra: see page 109, column 1, lines 16-27).

Referring to claim 12, Kabra et al disclose a method for automatic handling of errors within a database engine (see abstract, lines 6-8 – the sub-optimality is considered to represent the *error*), including the further limitations of:

executing a query access plan comprising a plurality of functions, each function including a first implementation method (see page 109, column 2, lines 34-37 and page 110, column 1, 10-15);

detecting a first error when executing a first function (see page 109, column 2, lines 34-37 and page 110, column 1, 10-15 – the error is found during execution of the execution plan; the execution plan is considered to represent the *query access plan*);

rebuilding the query access plan to generate a new query access plan (see page 110, column 1, lines 2-4 and lines 13-15 – upon the determination that the plan is sub-optimal, the query optimizer is re-invoked to generate a new execution plan); and

executing the new query access plan (see page 110, column 1, line 15 – the fresh new execution plan for the query is executed). However, Kabra fails to explicitly disclose the further limitations wherein the error is an execution error of a type that halts execution of the query access plan; receiving a second error while executing the first function within the new query access plan; rebuilding the new query access plan by replacing the first implementation method with a second implementation method of the function. Irie discloses creating a plan based on a search condition entered by a user and executing the plan (see abstract and Fig 1), including the further limitations of detecting an error while executing the plan, wherein the error is an execution error of a type that halts execution of the query access plan (see column 10, lines 31-38); receiving a second error while executing the first function within the new query access plan (Irie: see column 10, lines 31-49 and Fig 7); rebuilding the new query access plan by replacing the first implementation method with a second implementation method of

the function in order to increase the efficiency and accuracy of the execution of query plans (Irie: see column 10, lines 31-49).

It would have been obvious to one of ordinary skill in the art to use Irie's steps for rebuilding a plan after an error has been detected that causes execution to fail with method for query re-optimization as disclosed by Kabra which detects errors due to optimization. One would have been motivated to do so in order to increase the efficiency and accuracy of the execution of query plans with fatal errors.

Referring to claim 13, the program product is rejected on the same grounds as the method of claim 1.

Referring to claim 14, Kabra/Irie discloses the program product of claim 13, wherein the program code is further configured to:

receive an error while executing a function within the new query access plan [new plan fails] (Irie: see column 10, lines 31-55);

identify a first implementation method of the function within the new query access plan (Irie: see column 10, lines 31-55); and

rebuild [re-plan] the new query access plan by replacing the first implementation method with a second implementation method of the function so as to generate a rebuilt query access plan (Irie: see column 10, lines 31-55).

Referring to claim 15, the program product is rejected on the same grounds as the method of claim 7.

Referring to claim 16, the apparatus is rejected on the same grounds as the method of claim 1.

Referring to claim 18, Kabra/Irie discloses apparatus of claim 16, wherein the error is a function check [error in the join] (Kabra: see page 109, column 2, lines 29-33).

Referring to claim 19, Kabra/Irie discloses the apparatus of claim 16, wherein the program code is further configured to:

detect another error while executing a function within the new query access plan [new plan fails] (Irie: see column 10, lines 31-55);

identify a first implementation method of the function within the new query access plan (Irie: see column 10, lines 31-55); and

rebuild [re-plan] the new query access plan by replacing the first implementation method with a second implementation method of the function so as to generate a rebuilt query access plan (Irie: see column 10, lines 31-55).

Referring to claim 20, Kabra/Irie discloses apparatus according to claim 16, wherein the program code is further configured to: log information about the error, and the new query access plan (Irie: see Fig 9-11; and Kabra: see page 109, column 1, lines 16-27).

Referring to claim 21, Kabra/Irie discloses the apparatus according to claim 16, wherein the program code is further configured to: report the error (Irie: see column 10, lines 31-43).

Response to Arguments

9. In regards to the arguments of the 35 U.S.C. 101 rejections of claims 1, 3, 4, 7, 8, 10 and 12-15, the amendments to claim 1, 7 and 12 fail to overcome the rejections and

therefore the rejections withstand and the amendments to claims 13 and 15 overcome the rejections and therefore the rejections are withdrawn.

Concerning the arguments on page 7 and 8 regarding claims 1, 3, 4, 7, 8, 10 and 12, the examiner agrees that "execution of a query plan, in fact, results in the generation of result set from a database, which is useful and concrete," however since the result is never physically stored on displayed, the execution of the query is considered to lack a tangible result.

Concerning the arguments on page 7 and 8 regarding claims 13 and 15, the amendment is considered to overcome the rejection. The claim is now limited to a physical, recordable signal bearing medium, which according to the specification (page 9, lines 6-9) limits the signal bearing medium to a recordable type media. Therefore the claim is no longer considered to encompass the transmission type media.

10. Applicant's arguments with respect to claims 1, 3-8, 10-16 and 18-21have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimberly Lovel whose telephone number is (571) 272-2750. The examiner can normally be reached on 8:00 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Cottingham can be reached on (571) 272-7079. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kimberly Lovel
Examiner
Art Unit 2167

5 January 2007
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